CDF/D0: summary of expectations in long term

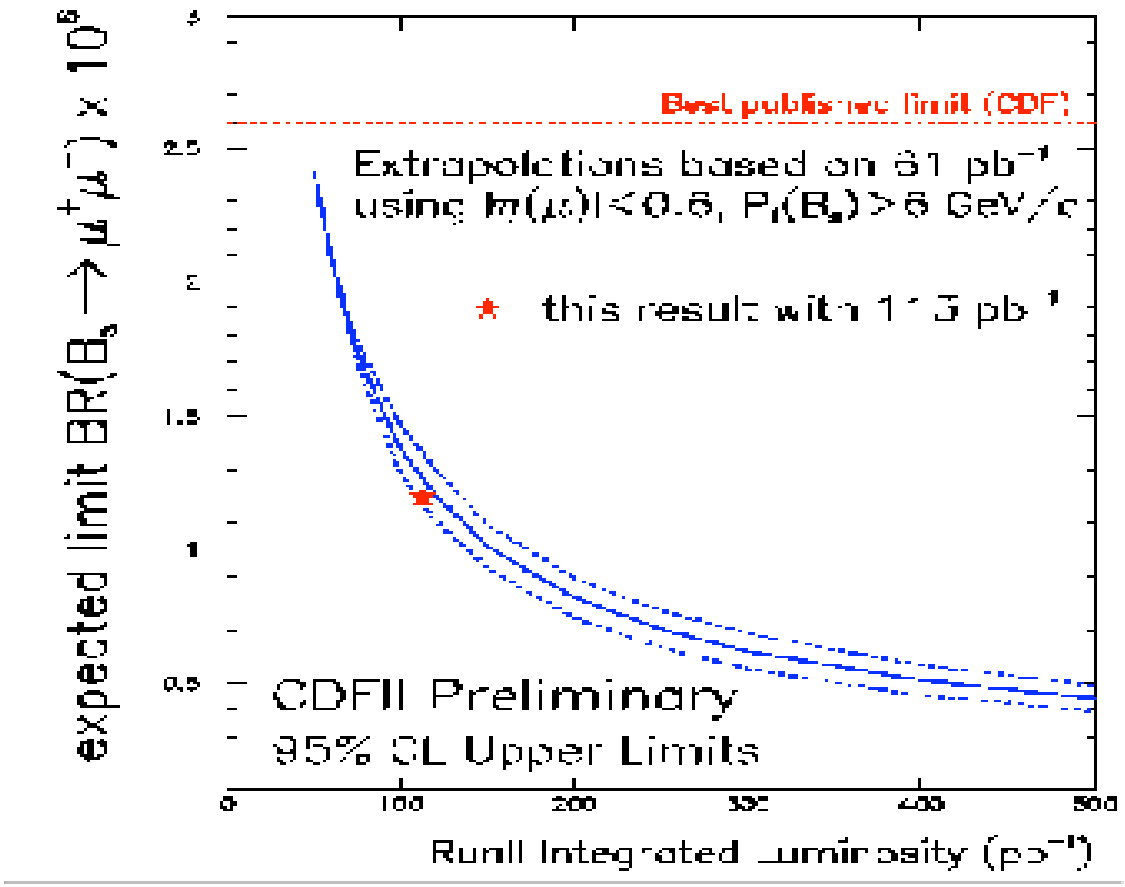
Guillelmo Gomez-Ceballos (M.I.T.)

- Prospects **VERY** preliminary (and in too few days!!!)
- D0's reach will be comparable to CDF's for most of the items

  - Luminosity:
    - Very unpredictable (2-4 fb^{-1})
    - We will use 2 and 3.5 fb^{-1} as benchmarks
    - Difficult to know if it is possible to use the same B triggers at higher luminosity
  - Trigger, reconstruction and tagging performance:
    - We expect to make several improvements (see my talk yesterday)
    - "Minimal" correction factor ~2.2

$B_s \rightarrow \square^+\square^-$ (limits also in B_d):

- D0: 1.3 10^{-8} (2 fb^{-1}) and 0.6 10^{-8} (4 fb^{-1})
- CDF:
  - Optimization analysis for 0.5 fb^{-1} (~0.5 10^{-6}), it is expected better performance
  - ~ 10^{-7} - 10^{-8} (2 fb^{-1}) at 95% C.L.

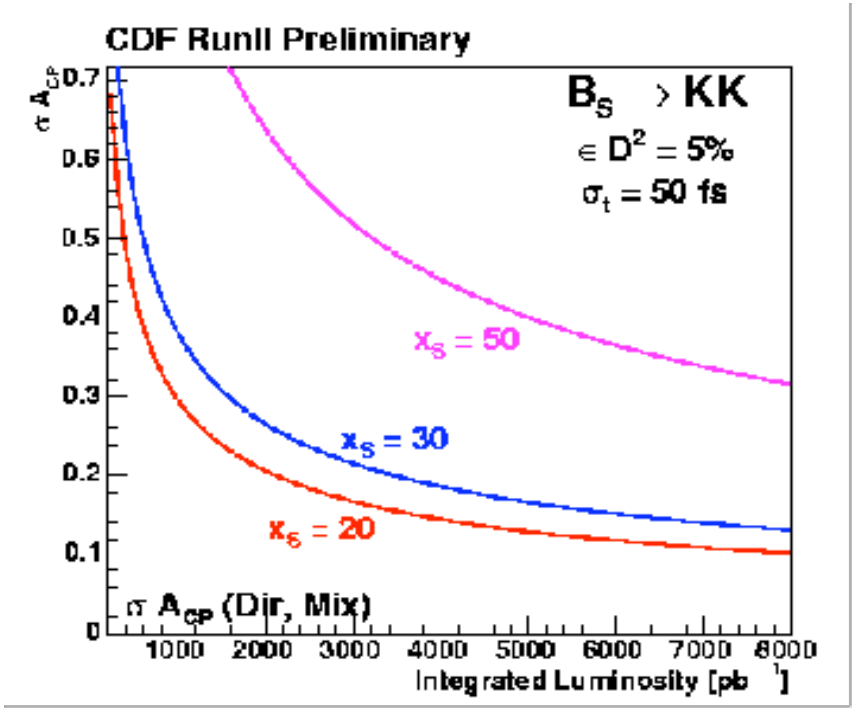


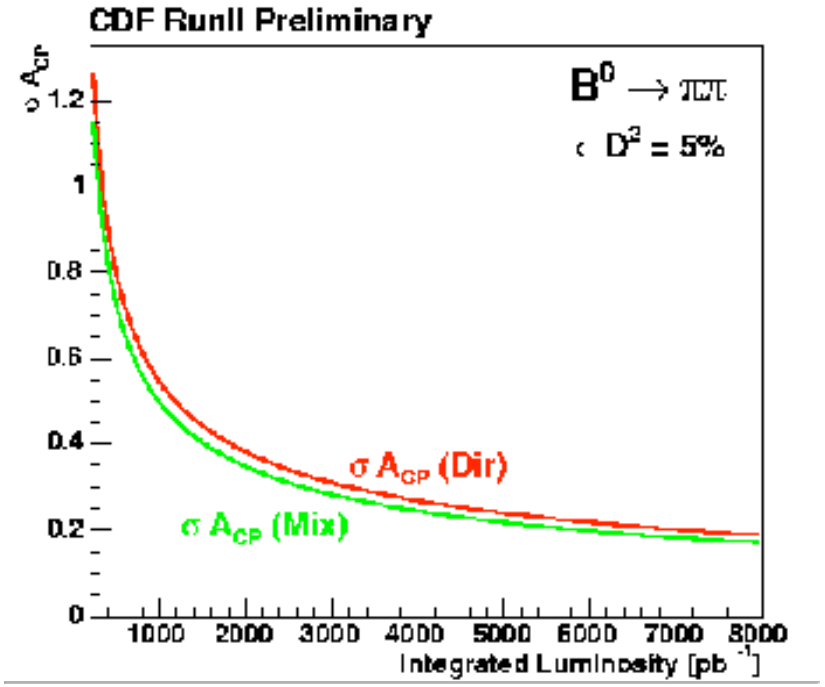
B_s mixing:

- D0: 2 fb^{-1}, $\Delta m_s = 15$ and $\Delta_t = 150$ fs
  - Please, be careful with these numbers!
  - Single muon trigger:
    - Bs $\rightarrow D_s \mu$ X (3.5 μ)
    - Bs $\rightarrow D_s$ e X (3.5 μ)
    - Bs $\rightarrow D_s \mu$ (2.2 μ), μ in the other side
  - Dimuon trigger:
    - Bs $\rightarrow D_s \mu$ X (3.0 μ), μ in the other side
- CDF: see my talk yesterday
  - $\Delta m_s = 15$, 2 σ limit with 0.5 fb^{-1}
  - $\Delta m_s = 18$, discovery with 1.7 fb^{-1}
  - $\Delta m_s = 24$, discovery with 3.2 fb^{-1}

- □□ and □□using B →hh: $A_{CP} = A_{CP}^{dir} \cos(\Box mt) + A_{CP}^{mix} \sin(\Box mt)$
  - Studies are in progress
  - A lot of activity in these channels

Mode	Yield 2 fb^{-1}	Yield 3.5 fb^{-1}
$B_d \to K\pi$	6700	11,725
$B_d \to \pi\pi$	1770	3097
$B_s \to KK$	4040	7070
$B_s \to K\pi$	1070	1870





da using ppp: no competitive results due to p^0 in the final state

db using fK*: no studied yet

Yields for B → mmK*: ~500 events for 2 fb^{-1}

dG/G ($\square_s$) using J/$\square$ f: uncertainty ~ 0.07 (0.055) for 2 (3.5) fb^{-1}

dg using $\square$→DK and B_s →D_sK:

- Cabibbo suppressed modes not measured yet, but included in the fits for B→Dp and B_s →$D_s\square$ BR measurements (see my talk yesterday)
- Expected yields (assuming BR($\square$→D$\square$) / BR($\square$→DK)~8%) :

Mode	Yield in 2 fb^{-1}	Yield in 3.5 fb^{-1}
$B^{\pm} \to D^0\pi^{\pm}, D^0 \to K\pi$	48,000	84,000
$B^{\pm} \to \overline{D}^0 K^{\pm}, \overline{D}^0 \to K\pi$	3990	6980
$B^{\pm} \to \overline{D}^0 K^{\pm}, (\overline{D}^0 \to KK + \overline{D}^0 \to \pi\pi)$	520	910
$B_s \to D_s\pi, D_s \to \phi\pi$	3200	5600
$B_s \to D_s K, D_s \to \phi\pi$	256	448